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Nest boxes for native wildlife

Artificial nest boxes, particularly in urban and rural areas, provide shelter and nesting sites for Australian bats, birds, bees and arboreal animals. Nest box trials in backyards, public areas and on farms have led to a range of designs for wildlife dependent on tree hollows to survive.

The importance of tree hollows to wildlife

Tree hollows are part of the natural ecosystem and are a valuable resource for our native wildlife. Findings from selected Australian research show that Australia has about 300 vertebrate species (approximately 15 percent of Australia's endemic and introduced terrestrial vertebrates) that use tree hollows for nesting, protection from predators, shelter and roosting. Among these are arboreal and terrestrial mammals, birds (nearly 90 percent of parrots) and more than half of Australia's microbat population.

Eucalypt forests with large remnants contain the greatest number of hollow-bearing trees and possibly the highest number of hollow-dependent fauna. The rate of hollow formation is dependent on the species of tree and its history (termite and fungi attack, burnt out by fire), which predisposes the tree to the shedding of branches and decay. As a general guide, suitable hollows take at least 100 years to form in eucalypts.

Hollow-bearing trees are often depleted by land clearing for urban development and agriculture.

This leads to the displacement and death of many hollow-dependent wildlife. Nest boxes can help species survive by providing artificial hollows for breeding and shelter.

What are artificial nest boxes?

Artificial nest boxes can substitute for tree hollows, providing arboreal species with nesting and roosting sites. Species such as the lorikeet have adapted well to urban areas through the use of artificial nest boxes. Birds, possums, gliders, bats and reptiles readily accept man-made nest boxes and use them in urban residential properties, public parks and farm forestry plantations.

The benefits of artificial nest boxes include biodiversity enhancement and greater understanding of urban wildlife. Nest boxes provide an

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opportunity to monitor fauna that is otherwise difficult to study. The presence of the wildlife is also an invaluable education tool.

While artificial nest boxes have been a success overseas, it is only recently that they have used as a valid conservation tool in Australia. Nest boxes in the Herbert River Catchment in north Queensland are being used to encourage barking owls, barn owls and masked owls to breed. The objective is to reduce the use of baits to control sugar cane rats. Nest boxes have also been used in threatened species recovery programs in other parts of Australia, such as the red-tailed phascogale in Western Australia.



Possoms regularly make use of nest boxes erected on the Douglas' Land for Wildlife property in south-east Queensland.

What species use hollows?

Possums, gliders, kookaburras, parrots, lorikeets, kingfishers, owls and microbats are some of the species that use tree hollows.

Introduced species such as the common myna, starling and feral bees also use hollows to breed. This should be discouraged as it prevents native wildlife from using the site. Bees can be discouraged through prudent use of pest strips.

Different species — different hollows

Different species have different hollow requirements (hollow size, depth, shape, degree of insulation and entrance size).

Small species, such as feathertail and sugar gliders, choose hollows that are only slightly larger than their bodies to prevent larger animals attacking them or taking the site.

Larger species, such as brushtail possums, greater gliders and ringtail possums, need hollows with entrances greater than 5cm. Common brushtail possums generally choose hollows with 12cm to 15cm entrances.

The width of the hollow determines how much space a species has for nesting and sleeping.

Species such as the sugar glider live in family groups and therefore need larger hollows. The micro-climate inside the hollow is also important (particularly for micro-bats) and this can be affected by depth. Studies have shown that deeper, wider hollows have a greater likelihood of occupancy. Deeper hollows can deter would-be predators.

One hollow may be used by several species at different times and one animal may use several hollows in its lifetime.



One nest box may be used by several species at different times. These feathertail gliders made use of bat boxes in south-east Queensland.

Construction of artificial nest boxes

You can buy or make a nest box. Many designs on the market take into consideration the animal's safety and comfort, insulation and protection of access.

Nest boxes can be made from timber or exterior-grade plywood (2mm to 19mm is ideal).

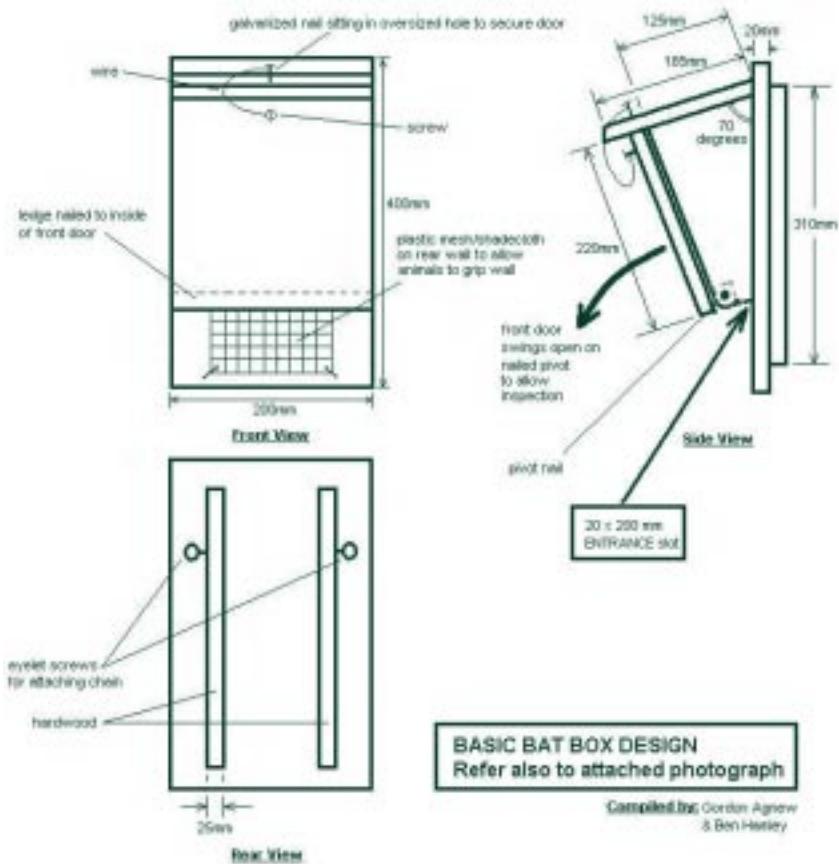
To waterproof the box, screw the ends together and paint the exterior. Do not paint inside the box. Sawn timber boxes such as these should be well ventilated and have good drainage (a small gap under the roof or a few small holes in the floor). Avoid using treated timber, toxic paints, chipboard or smelly glues and make sure there are no sharp edges or protruding nails.

Some designs use hollow logs and while they make excellent nest boxes, they can be quite heavy.

Nest box dimensions for Australian birds and arboreal species have been developed in response to particular species requirements. Kookaburras need a nest chamber floor that is the same level as the entrance for hygiene reasons (kookaburras keep their nest clean by defecating out of the entrance). Sugar gliders have indicated a preference for entrances positioned at the rear of the box between the box and the trunk.

The inside diameter, entrance above the floor, height above the ground and placement should be considered when constructing and hanging a nest box. Entrance holes should be just large enough for the animal to enter. For more information about commercially available nest boxes search Australian internet sites for "nest boxes".

Complete bat box design.



Many of these designs have been developed from extensive research on artificial nest boxes and trial and error. The websites also provide information on research into nest box use and management of pest species.

Installation of artificial nest boxes

The location of a nest box is important. The best occupancy rates appear to be in variegated landscapes, that is where there is a matrix of farmland, horticulture and rural residential. Some research has shown that few animals are attracted to artificial nest boxes when there are already natural hollows available.

Proximity to food resources and water are also considerations. Many nursery bat colonies, for example, choose roosts within 400m of water.

Nest boxes should be protected, with the entrance preferably facing away from the prevailing winds. Nest boxes should be placed in an open area that is shaded from the midday sun. Avoid putting them in dense foliage.

Nest boxes can be mounted on trees, poles or buildings. Boxes can be attached to the trunks of trees with wire or two coach screws with metal spaces to allow for tree growth without putting stress on the nest box. Alternatively, nest boxes can be fixed in trees by resting the box in the fork of a tree and securely wiring it in position.

Cats can be a problem in urban areas. To stop cats and rats from accessing the nest box, wrap a metal sheet (about 1m wide) around the base of the tree or pole.



Photo Luke Hogan

Boxes erected in farm forestry plantations in south-east Queensland attracted Gould's long-eared bat *Nyctophilus gouldi*.

Ensure the metal sheet is high enough to prevent the cat jumping over it.

Managing pest species

Unfortunately, artificial nest boxes may also attract starlings, Indian myna birds and other introduced species. These species, which show no preference for the size or shape of hollows, can be very aggressive. The only satisfactory control is to remove their eggs and nest.

Monitoring evidence in hollows

The monitoring of nest boxes can be crucial to their success whether they are being used in research or for backyard wildlife conservation. The monitoring process is simple and requires not a lot more than a set of binoculars and a monitoring sheet.

By monitoring animal activity and studying evidence left in the hollow — scats, twigs and leaves and eggs — we can gain a better understanding of the use of hollows in a particular area. Information obtained by monitoring the use of both natural and artificial hollows is important to the management of native forests and in planning for adequate hollow availability across the landscape.

For private landholders, the collection of data on faunal activity on their property can provide invaluable information for future wildlife conservation practices, as well as being a rewarding experience.

Monitoring nest boxes is also necessary for the control of pest species. Ensure the boxes are positioned where you can easily inspect them for pest species. If native arboreal species are displaced by pest species, nest boxes become useless.

There is a large amount of literature on the evolution of nest box design and use. In Australia the use of nest boxes is still in the experimental stage so it is worth trying several nest boxes of various shapes and sizes in different locations.

While artificial nest boxes play a role in wildlife and biodiversity conservation, they can only play a supporting role in the substitution of the true tree hollow.

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Further reading

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Website references

Australian animals, tree hollows and nest boxes at <http://users.bigpond.net.au/ozbox/animal&choll.htm>

Why Hollow Log Homes? at <http://hollowloghomes.com.au/Why.htm>

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